period free from rain, approaches in respect to its depth the normal, when the existing pollution is the normal pollution. Bacteriological examinations at high water, or at low water, at the time of beginning rise, or at the time of local rains without rise, may lead to gross errors, and are, in consequence, worthless for the estimation of the normal pollution. At points where considerable pollution by organic matter is observed, the number of organisms is largely dependent on the temperature, which, however, has no marked influence where their number is small. With rising water, the differences in the pollution at single points, which stand out sharply in comparison with the normal pollution, may to a greater or less extent disappear, and thus the influence of polluted influents and of the self-purification of a river may be more or less hidden.

[From a practical sanitary standpoint, the nature of the occasional and constant polluting influents is of much greater importance than the amount, especially when, as is often the case, two or more polluting influents of widely different character may, by their mutual action on each other, bring about extensive chemical as well as bacteriological purification.]

Influence of Pollution, Temperature, and Ventilation on the Hardness of Ground Water.—DR. GUSTAV VON RIGLER (*Archiv für Hygiene*, xxx. 69), in determining the influence of these factors, used clean sand as a soil and urine mixtures of varying percentage-composition as a polluting agent, and obtained some striking results. The amounts of lime and magnesia in the urine mixtures were determined in each case before the latter were employed. The first series of tests made with distilled water demonstrated that less and less lime and magnesia are washed out of the soil as the exposure continues. Next, using water containing 1 per cent of urine, and, therefore, insignificant amounts of lime and magnesia, it was shown that the hardness of the effluent was increased gradually from ten to forty-eight degrees. Employing 10 per cent. of urine the hardness rose more rapidly from eleven to two hundred and sixty-nine degrees. Adding, from day to day, to the same specimen of sand, mixtures of urine containing first 1 per cent., then 2½, 5, 7, and 10 per cent., it was found that the hardness rose gradually, and then fell, the highest degree attained being with 5 per cent. Thus, excessive pollution reduces the power of the water to withdraw lime and magnesia.

Experiments on the influence of temperature proved that the hardness rises and falls respectively with increased and diminished heat.

Investigating the effect of aëration, he showed that from a soil extensively polluted but well aired, the effluent water rapidly gains, then gradually diminishes in hardness; but that when it is not well aired, the hardness increases slowly but constantly. With extensive pollution and no aëration, the hardness increases gradually for a time, and then gradually falls.

The degree of pollution, the temperature, and the amount of air present exert individually and collectively a great influence on the decomposition processes in the soil, particularly the formation of carbon dioxide, nitric acid, etc., and hence on the solution of the constituents to which hardness is due.

Cause of Death of Fishes in Polluted Rivers.—DR. W. THÖRNER (*Forschungsbericht für Lebensmittel*, 1897, 172) has thrown considerable light on the cause of death of fishes in polluted streams by his investigation of a case where, in spite of the large extent of pollution present in a river, the water could not be regarded as abnormally foul, and yet large numbers of fish had died. The polluting matters were partly in solution and partly in suspension, and much in a condition for further oxidation. He noticed considerable amounts of ferric hydrate, and its presence suggested that the iron had entered the river in the ferrous form, and had then been oxidized at the expense of the dissolved oxygen of the water. The complete or very large withdrawal of this element by the process of oxidation would naturally render the water incapable of sustaining fish life. Analysis of two samples of the water showed in the one case 57.2 c.c. of total dissolved gases per litre, consisting of 60 per cent. of carbon dioxide and 40 of nitrogen, and in the other 67.2 c.c., consisting of 67.2 per cent. of carbon dioxide and 32.8 of nitrogen. Thus, in neither case was there any oxygen, and hence the death of the fish.

[This explains, in part at least, the disappearance of fish-life in many streams polluted by the sewage of manufacturing establishments, and why the same does not occur where sewage outlets enter the sea, where there is necessarily much aëration.]

Inoculations for Plague.—PROF. HAFFKINE'S report to the Bombay Standing Committee on the results of inoculation for plague gives an account of his work on the inmates of the jail at Byculla. Between January 23d and 29th nine cases occurred, five of which were fatal. At the beginning of the outbreak the population of the jail was 345. On January 30th, prophylactic treatment was applied to 154 inmates who volunteered to be inoculated. One person had a painful gland in the left groin and two others developed painful glands in the left axilla the same evening; the three cases proved fatal. On the following day two cases occurred among the inoculated, and both died. One of the inoculated persons was taken, but recovered. On the second, third, fifth, and sixth days cases occurred among those who had not been inoculated; all fatal. No cases occurred among those who had been inoculated from the first day until the seventh. On the seventh day there were five cases among the non-inoculated, one of which was fatal, and one occurred among the inoculated, but ended in recovery. From January 31st to February 6th twelve cases occurred among the non-inoculated, six of which were fatal, and but two cases among the inoculated, both of which recovered.

Haffkine concludes that the injection of 3 cubic centimetres of prophylactic seems to be sufficient to effect the desired protection. It cannot arrest symptoms already started or that show themselves within a few hours, but the time necessary for it to produce the protective effect is very short.

Transmission of Typhoid Fever through the Air.—The fact that many authorities regard infected air as a common, and, indeed, by some as the principal, medium of transmission of typhoid fever, led DR. EDUARDO GERMANO (*Zeitschrift für Hygiene und Infectionskrankheiten*, xxiv. 403) to institute a series of experiments to determine whether or not this view can be supported by facts. The infected air theory is based on a large number of observations, the value of which must not be overrated, and Germano cites